

WHAT IS CLAIMED IS

1. An optical connector system for connecting together the ends of first and second sets of optical fibers that each includes a plurality of optical fibers that each have tips, comprising:

first and second housings that each has a mating face and that each has a plurality of parallel fiber-receiving bores extending in a longitudinal direction through the corresponding housing to the mating face thereof, with each bore having a front end portion that extends to the mating face of the housing, with said fibers of said first set each extending through a different one of said bores of said first housing and with said fibers of said second set each extending through a different one of said bores of said second housing, with each fiber having an end fixed in position in the corresponding bore;

for each of said housings, the tips of each of said fibers lying in the housing and the mating face of the housing, all lie precisely flush and in a common optical plane;

a quantity of potting material lying in each of said bore front end portions and around a fiber portion that lies in the bore front end portion;

each of said bore front end portions has an inside diameter that is less than twice the outside diameter of the fiber portion lying therein.

2. The system described in claim 1 wherein:

the diameter of each bore front end portion is no more than 110% of the diameter of the corresponding fiber portion lying therein.

3. The system described in claim 1 including:

the diameter of each bore front end portion is no more than 102% of the diameter of the corresponding fiber portion lying therein.

4. The system described in claim 1 wherein:

5 said first and second housings are substantially identical, and are each symmetrical about first and second perpendicular planes that are each normal to the mating face of the corresponding housing, with each housing having top and bottom ends, with an alignment hole at one end and with an alignment pin at the other end, with said hole and said pin having substantially the same diameter.

5. The system described in claim 1 wherein:

each of said housings has a front peripheral portion that surrounds the mating face of that housing, with each front peripheral portion including a groove that extends completely around each of the corresponding mating face;

a pair of elastomeric seals that each extends in a closed loop and lies in a corresponding one of said grooves, with said seals pressed against each other to seal the volume where said mating faces lie facewise against each other.

6. The system described in claim 1 wherein:

5 said first and second housings are substantially identical, with each housing having opposite first and second sides and having first and second opposite flanges with first and second holes in each flange wherein each first hole lies closest to said first side and each second hole lies closest to said second side;

a pair of panel mount screws, each lying in the first hole in a first of said flanges and the second hole in the second of said flanges of said first housing, for mounting said first housing on a panel;

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a pair of connector-joining screws, each lying in the second hole of said first flange and in the first hole of said second flange of said second housing, for projection into empty holes in said flanges of said first housing to join said second housing to said first housing.

7. An optical connector arrangement, comprising:

a first housing having front and rear ends, with said front end forming a first planar mating face, said first housing having a plurality of parallel bores with front portions opening to said mating face;

a first set of a plurality of optical fibers that each extends through one of said bores, with each fiber having an end portion with a tip lying at said mating face;

a plurality of first quantities of set potting material each lying in one of said bores and around the end portion of the fiber lying in the bore;

said mating face lying precisely in a plane and said fiber tips all lying in said plane and flush with said mating face;

said bore front portions each has an inside diameter no more than 10% of the outside of the corresponding fiber.

8. The arrangement described in claim 7 wherein:

said housing has a back end portion where said bores merge into a cavity, and said quantities of potting material merge in said cavity, with said housing having walls that close said cavity except at the rear end of said housing, whereby said housing rear end can be uppermost while liquid potting material lies in said cavity and while said fibers are moved forwardly along said bore front end portions.

9. The arrangement described in claim 7 including:

a second housing which is identical to said first housing, and which has a second planar mating face, a second set of a plurality of optical fibers lying in bores of said second housing and having fiber tips precisely flush with said second mating face, and a plurality of second quantities of set potting material each lying around an end portion of one of said second fibers that lie in said bores of said second housing;

said first and second housings being fastened together with their faces lying facewise against each other.

10. The arrangement described in claim 9 including:

a panel which has a connector-holding area with opposite area ends, with a pair of panel through holes in each area end;

each of said housings has opposite ends with flanges at said opposite ends and with a pair of holes in each flange, each pair of holes including first and second holes lying adjacent to said first and second sides, respectively, and each pair of holes of a flange of said first housing being aligned with a pair of holes of a flange of said second housing;

a pair of panel screws each extending through one of said panel holes and through one of said flange holes of said first housing, with a first of said panel screws extending through the first hole in a first of said flanges and through the second hole in a second of said flanges;

a pair of housing connect screws each extending through one of said panel holes and through a hole in a flange of said first connector and through a hole in a flange of said second connector, including a first connect screw that extends through the second hole in said first flange of said first housing and a second screw that extends through the first hole in the second flange of said

first housing.

11. A method for constructing on optical fiber connector that includes a plurality of optical fibers, comprising:

inserting said plurality of fibers forwardly through bores in a first housing, including projecting front portions of the fibers through bore front portions and forward of a first mating face of the first housing while a first quantity of fluid potting material lies in a first housing cavity that is rearward of said bores and that communicates with said bores, including dragging said fluid potting material forwardly along said bores by said fibers as said fiber front portions are projected forwardly;

allowing said potting material to set to a solid state, removing said fiber projecting front portions, and polishing front tips of said fibers and said mating face so said mating face is flat and the front tips of said fibers are precisely flush with said mating face.

12. The method described in claim 11 wherein:

inserting fibers whose outside diameters are at least 90% of the inside diameters of said bore front portions, and allowing surface tension of said fluid potting material center said fibers in said bore front portions.